

STATEMENT OF WORK  
XMW058-3 (PLAINS)

Background

The U.S. Environmental Protection Agency's (EPA's) Environmental Monitoring and Assessment Program (EMAP) is developing an approach for sampling rivers and streams across the United States. Integral to this approach is the collection and identification of assemblages of biological organisms. Such assemblages represent the ultimate integrators of human perturbations to aquatic systems. EMAP has identified aquatic vertebrate assemblages (fish and amphibians) as one of several indicators that will be used to assess the condition of aquatic resources. Fundamental to the ability to utilize these data is the careful and detailed verification of the taxonomic identification of individuals collected, followed by permanent archival in a scientific museum.

Beginning in the summer of 2000, and continuing for 4 years, EMAP will be collecting aquatic vertebrate data in rivers and streams across the Western United States. During the summer of years 2000-2003, the contractor receiving this award shall accept shipment of preserved voucher specimens of aquatic vertebrates from approximately 56-63 stream and river sites (per year) in the states of Colorado, Wyoming, Montana, North Dakota, and South Dakota. Samples will be provided by EPA to the contractor, along with a computer file of site locations and other pertinent information to facilitate developing a permanent catalog record of the voucher specimens submitted for archival.

EPA anticipates generating approximately 5 voucher samples (multiple individuals/sample) for each site in the list below, to be received by the contractor by October 31 of each year.

State	Year(s)	Number of Sites
Eastern Colorado	2000-2003	4-5/year
Eastern Montana	2000-2003	8-9/year
North Dakota	2000-2003	20-22/year
South Dakota	2000-2003	20-22/year
Eastern Wyoming	2000-2003	4-5/year

TASKS

Task 1: The contractor shall identify voucher specimens to species for all adults and juveniles. Where large numbers of small, difficult to identify (or hybridized) individuals are collected, subsampling and reporting percentage species composition is acceptable. The contractor shall prepare and deliver summary reports (as described in the Deliverables section below) to EPA within 4 months of receipt of the voucher specimens.

Task 2: The contractor shall examine photographs of large specimens to verify species identification. Typically, easy-to identify game fish will not be included in voucher collections, but will be photographed and returned to the stream alive. The contractor shall prepare and deliver summary reports (as described in the Deliverables section below) to EPA within 4 months of receipt of the photographs.

Task 3: The contractor shall catalog and archive the voucher specimens in the permanent collection.

Specimens will be preserved in the field in 10% borate-buffered formalin. Two types of aquatic vertebrate samples may be collected. Voucher samples contain selected specimens of individuals identified and counted in the field; they provide a record of what was collected in the field and released. Unknown samples contain specimens that could not be confidently identified in the field. The contractor shall transfer specimens to alcohol for permanent storage. In general, both voucher and unknown specimens will be limited to small fish (juveniles, small adults) and amphibians, so as not to be a space burden. The contractor may submit a request to EPA in advance that additional specimens be preserved. Each putative species will be placed in a separate mesh bag with a numbered tag by the field crews. The species identified by the contractor from the bag must be linked back to that specific tag number for each site so that EPA can link each voucher species with a unique tag number. This number, in turn, can be linked to species identified on field sheets, whether or not they were correctly field-identified, and whether or not the bag contained more than one species. In addition, these species identifications can be used to infer proportional abundances of released fish species in the field collections. It is critical that this chain of identification be maintained.

Following standard museum practices, the contractor shall archive the specimens in their permanent collection. After seven years, the contractor may dispose of large specimens after notifying and receiving approval from EPA. The contractor's collection must be located in a climate controlled environment in order to ensure sample integrity. The contractor must have a permanent computerized catalog database, with daily backups in order to assure long-term sample tracking and data retrieval. Samples must be stored in sealed jars in 70-75% ethanol OR isopropanol on shelves. Jars shall contain permanent museum labels (preferably printed on waterproof paper with indelible printer ink. Hand written labels are acceptable.) Disposal of any hazardous waste (e.g., formalin, ethanol or isopropanol) shall be the responsibility of the contractor.

The contractor shall submit a reference list of taxonomic keys to be used in the identification of aquatic vertebrates from this project for approval by EPA. If supplemental references are required, it shall be the responsibility of the contractor to acquire them. When the contractor staff encounters a specimen with which it has little experience, it is expected that the curatorial staff shall seek expert opinion on verification of the identification.

#### Period of Performance

Base Period: September 1, 2000 through August 31, 2001  
Option Period 1: September 1, 2001 through August 31, 2002  
Option Period 2: September 1, 2002 through August 31, 2003  
Option Period 3: September 1, 2003 through April 1, 2004

#### Deliverables

The following reports shall be submitted:

1. The contractor shall provide an electronic (any common database is acceptable) and hardcopy report on species identifications and counts by sample type (voucher vs. unknowns) for each stream sampling event (stream-date combination) and tag number. Where subsampling techniques

are used, counts of the group from which the subsample is drawn and counts of the identified subsample shall be reported by sample type, sampling event and tag number. Hybrids shall be identified to the lowest taxonomic level reasonable, and probable crosses identified. Both electronic and hardcopy files shall be provided to EPA within 4 months of receipt of voucher specimens or photographs. Final reporting of difficult specimens and hybrids may be delayed to allow for specimens to be exchanged with taxonomic experts at other locations.

2. The collection data shall be entered into the contractor's catalog/data system. One set of hard copies of these data shall be sent to EPA for review with Deliverable #1.